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ABSTRACT

This study investigated the issue of whether a shift occurs in infant play goals at around the beginning of the second year in terms of the organization of object-directed and caregiver-directed attention and preference for toys that require the caregiver's involvement. A total of 108 infants of 10, 15, and 29 months were observed playing with "nonsocial" and "social" versions of toy trains. Children could play with the nonsocial train alone, but the social train required the involvement of an adult. The 15-month-olds were expected to play more than the other subjects with the social toy and to attend more to the mother when playing with the toy. Records were made of subjects' looking time for the two toys and the mother. Toy preference was measured by comparing the time spent looking at each train. Gazes to mother preceded and followed by gazes to a particular version of the toy were considered associated with that toy. Results, which offered moderate support of the hypothesized age change in toy preference, showed that 15-month- olds, but not younger and older infants, looked longer at the social toy than at the nonsocial toy. Furthermore, 15-month-olds organized more attention to mothers in relation to the social toy than to the nonsocial toy; more attention in relation to the social toy than 10-month-olds; and less in relation to the nonsocial toy than 29-month-olds. (RH)

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Age differences in the goals of toddler play

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ABSTRACT

The individual's goals in play are adjusted to their emerging abilities in order to maintain a moderate challenge. Early in the second year, when social competence increases, play would be expected to become more social, as evidenced in the organization of play behavior and toy preferences. Results of this study showed that 15-month-olds, but not 10- and 29-month-olds, attended longer to a toy that required adult involvement compared to an otherwise identical toy that did not. Also, 15-month-olds organized more attention to their mothers in relation to the social toy compared to 10-month- olds, and less in relation to the nonsocial toy compared to 29-month- olds. These age differences support a model of play as a strategy for creating moderately challenging experiences.

INTRODUCTION

Play, typically operationalized as self-chosen, intrinsically motivated behavior, begins very early in infancy and changes dramatically with age. However, little is known about why a particular individual plays in certain ways. One theoretical view of play focuses on the structure and developmental content of play, the other on the function and motivation for play. Those who have focused on the developmental content of play have studied structural changes in play in relation to changing abilities (Belsky & Most, 1981; Fenson & Ramsey, 1980; Nicolich, 1977) and explained play as assimilative practice of new skills (Piaget,1962; Vygotsky, 1967). Those who have focused on the motivation or goals of play have studied similar functions of play even when the behaviors are structurally distinct and have suggested that the motivation for play is to modulate arousal (Berlyne, 1969;), to create and resolve uncertainty (Ellis, 1979), or to provide the thrill of mastery (White,1959) or pleasurable feeling of power from "being the cause" (Piaget, 1962).

Play researchers from both theoretical orientations generally agree that play involves some sort of match between the individual's abilities and the challenge of the task (e.g., discussions in Sutton-Smith, 1979). An integrated perspective, considering both structure and function and explaining the motivation for play in relation to the developmental content of play, has been formulated in theories and research on mastery motivation, operationalized as individual differences in persistence at moderately challenging tasks (Redding, Morgan, & Harmon, 1988; Yarrow, McQuiston, MacTurk, McCarthy, Klein, & Vietze, 1983). In response to a moderate level of uncertainty about competence, the individual tests developing abilities in play and thereby experiences the "thrill of mastery."

This integration of content and purpose provides a view of play that may be further explored in terms of general systems theory (Sameroff, 1983) which suggests a model of play as a behavioral system affected by changes in other behavioral systems or the external environment. As a system, play functions as a general strategy for regulating uncertainty about competence by manipulating play materials, be they objects or people, to create experiences that challenge competence. Play is kept challenging by

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reorganization of behavios and adjustments of tasks in relation to emerging abilities. The individual may actively seek out easier or more difficult opportunities in the environment and thereby actively adjust the difficulty of the task.

Changes in the goals of play would be expected around the beginning of the second year of life when infants become able to understand means-end relations and use that understanding for the purpose of social influence (Crawley & Sherrod, 1984; McCall, 1979; McCall, Eichorn, & Hogarty, 1977; Rogoff, Mistry, & Radziszewska, in press). By the next year of life, play goals are likely to change again in relation to developmental advances in verbal competence and emotional independence (Nicolich, 1977; Sroufe, 1979). As the goals of play change, individuals may make different toy choices. For example, one-year-olds may come to prefer toys that require the mother's involvement in play. Both White's (1959) effectance motivation explanation of play and Piaget's (1962) practice play explanation would lead to a prediction that children at any age would prefer a toy with which they could be more successful and could readily assimilate. However, the model suggested here would predict a preference for a toy that requires adult help at the age when infants are "playing" with initiating caregiver involvement but not at younger or older ages.

This study was designed to observe age differences in preferences for two toys that differed only in that one required adult involvement. Around the beginning of the second year, when eliciting caregiver involvement is an emerging ability, a shift in infant play goals was expected to be evident in the organization of object-directed and caregiver-directed attention and also in preferences for toys that require the caregiver's involvement.

METHOD

Subjects. Three groups of infants, 36 in each group, were tested: 10-month-olds (M = 10.2, sd = .31), 15-month-olds (M = 15.1, sd = .37), and 29-month-olds (M = 29.6, sd = .54). The youngest group included 13 males and 23 females, the middle group 17 males and 19 females, and the oldest group 13 males and 23 females. The oldest age group was included in this study to test the prediction that older toddlers, who are very competent in their ability to engage the caregiver by primarily verbal means (McCall et al., 1977) and increasingly autonomous in their instrumental behavior (Kopp, 1982), would no longer test that ability in their play.

Apparatus. Subjects were observed playing with two toy trains, designed in two almost-identical versions: "nonsocial" toy (could be played with alone) or "social" toy (required involvement of adult). The requirements for the toys were that all infants could manipulate them, that they would provide visually identical displays, that there would be no removable parts, and that there would be a clear choice for the infant for social involvement. The toys constructed to meet these criteria were two battery-operated trains, each moving in a circular path on a table, and each with a pair of push-down levers that caused gates to open, allowing the trains to continue on their paths. For each train, one gate was positioned within easy reach of the infant and one was positioned at the rear, out of reach of the infant, but within reach of the mother. The two trains were identical, but the rear gate for the nonsocial train was propped open to allow the train to pass through without the mother operating the gate. Each gate had a bright green curtain to highlight the train passing. A highchair was positioned so that the front gates were within the infant's reach, but the trains were out of reach. For half the subjects (18) in each age group the social toy was on the infant's right, for the other half it was on the infant's left.

Procedure. Subjects were observed for ten minutes seated in front of the two trains. Mothers were given a questionnaire to complete during the observation to minimize their attention to the infants. After familiarizationg the infant with the toy, an experimenter told the mother, "We are interested in how your child plays with these toys. You may encourage your child to play with the trains but please do not

encourage play with one particular train. Open this gate [indicating the social gate] when the train is stopped there, but please do not initiate other interactions with the toys or touch any of the other gates." The experimenter observed the subject from behind an observation mirror and recorded the subject's looking time to the two toys and to the mother by pushing three buttons connected to a computer.

Dependent Variables. Toy preference was measured by comparing the duration of looking to each train. The association of gazing to mother with the two versions of the toy was distinguished in the following way: gazes to mother preceded and followed by gazes to the same version of the toy were considered "associated" with that toy and expressed as a proportion of the total looks to mother. Fifteen-month-olds, but not the other two age groups, were expected to play more with the social toy and to attend more to mother when playing with that toy. Gazes to mother imbedded between looks to different trains were considered "transitional" and analyzed separately. Because the amount of looking to mother differed among the age groups, looks to mother imbedded between looks to the trains were expressed as proportions of the total looks to mother. These data allowed analyses of the organization of object-directed and social-directed attention during play with the "nonsocial" and "social" trains. Attention to mother was predicted to be greater in association with the "social train" for 15-month-olds as a reflection of their preference for social-object play, the "nonsocial" train for 29-month-olds as a reflection of motivation for independent mastery , and random for 10-month-olds.

Agreement and reliability. Two observers simultaneously observed infant gazing during several sessions before and during data collection. Of the 108 subjects considered in the final data analyses, 24 (22%) were observed by two observers. For infant gazing to mother, the average proportion of agreement was .92 with an average Kappa of .68. For infant gazing at trains, the average proportion of agreement was .91with an average Kappa of .79 . Intraclass correlations, assuming random raters, were .97 for infant gazing to mothers and .93 for infant gazing to the trains.

RESULTS

The mean looking durations to the trains are shown in Table 1. As predicted, only 15-month-olds showed a significantly greater amount of visual attention to the social versus the nonsocial train (paired $t(35) = 2.92$, $p = .006$). Within-group comparisons for the other two age groups were not significant. It was predicted that 29-month-olds would show more interest in the nonsocial train than the social train, but there was not a significant difference between visual attention to the two trains in that age group and, in fact, the means favored the social train. Between-group age comparisons were not significant.

Fifteen-month-olds were also expected to show more attention to their mothers in association with the social toy, and 29-month-olds were expected to show more attention to their mothers in association with the nonsocial train. The mean proportions of duration of looking to mother imbedded in each possible sequence of looks to the trains are shown for each age group in Table 2. As predicted, 15-month-olds, but not the other age groups, spent more looking time to mother between looks to the social train than the nonsocial train (paired $t(35) = 3.40$, $p = .002$). Between-group comparisons revealed that there was a greater duration of looking to mother associated with the social train for 15-month-olds than for 10-month-olds ($t(105) = 2.72$, $p = .008$). The 29-month-olds, compared to 15-month-olds, spent more looking time to mother associated with the nonsocial train ($t(105) = 2.18$, $p = .031$).

Age groups were also compared for the transitional looks to mother, that is, those looks imbedded in a sequence from one train to the other train (Table 2). Compared to 15-month-olds, 29-month-olds looked at their mothers more in these transitional sequences, both in the sequence social train-mother-nonsocial train ($t(105) = 2.204$,

$p = .044$) and in the sequence nonsocial train-mother-social train ($t(105) = 3.07$, $p = .003$). There were no significant differences in these measures between 10-month-olds and 15-month-olds.

DISCUSSION

The model of play presented here suggests that play is a system of behavior that provides the individual with a strategy for testing emerging skills by creating moderately challenging tasks. When new abilities are emerging, individuals change their play by reorganizing behavior or selecting different play materials. For one-year-olds, emerging skills include initiating interaction with the caregiver and integrating objects in social interaction (Bruner & Sherwood, 1976; Crawley & Sherrod, 1984; Eckerman, Whatley, & McGehee, 1979; Green, Gustafson, & West, 1980; Rheingold, Hay, & West, 1976). In light of those emerging skills, one-year-olds were predicted to have new play goals evident in the organization of visual attention to persons and objects during play and in preferences for toys that require social involvement.

By providing novel toys in an experimentally controlled situation with three age groups, this study offered a test of the prediction that changes in play goals would be evident around the beginning of the second year. The results offer moderate support for this model of play by showing that 15-month-olds, but not younger and older age groups, looked longer at a social toy that required the mother's involvement than at a nonsocial toy. Furthermore, 15-month-olds organized more of their attention to their mothers in relation to the social toy than to the nonsocial toy, more in relation to the social toy than 10-month-olds did and less in relation to the nonsocial toy than 29-month-olds did. Together, these are all indications of more social goals in play by 15-month-olds: Only 15-month-olds preferred the social toy and organized more of their social attention in relation to it. Further evidence of age differences in the organization of attention during play was found in 29-month-olds' more frequent "transitional" looks to mothers between a look to one train followed by a look to the other. Nevertheless, these results offer only moderate support of the hypothesized age change in toy preference because the effect of the social nature of the toy, albeit significant only in the 15-month-old age group, did not interact significantly with age.

Age differences in toy preferences may be better tested with toys that are more familiar yet still varying in social involvement opportunities. The two trains were novel and engaging for subjects and their mothers in all three age groups. The mothers, asked not to encourage play with one train or the other, may have encouraged play with both trains more equally than expected by their enthusiasm for the task; and although given a questionnaire, many mothers in the study gave up trying to do the questionnaire so they could play with the trains. They were then available for joint attention to either train, thus circumventing the experimental control of the social play opportunities of the two toys. Age differences also may be better tested by using a direct assessment of developmental skills to test in relation to play goals, in addition to using the developmental literature to estimate which skills are emerging at different ages. In addition, longitudinal research is needed to test predictions about how particular individuals may change their play over time.

What distinguishes this research from research using traditional views of play is the inferences about play goals in relation to what is known of the skills emerging at a given age. The study was designed to measure age differences in play behavior in such a way that the age changes in the goals of play could be inferred. Based on age differences in emerging skills, infants at different ages were expected to have different goals in their play, even though many of the actual play behaviors were the same. All three age groups looked at the toys and their mothers, but they differed in how their attention was organized. The measures of the organization of attention were used to make inferences about the goals of the infants in their play. The typical measures used in play research have assessed either the complexity or amount of play, or, less

commonly, both (McCall, 1974). Developmental views suggest qualitative measures of the complexity of play (e.g., Belsky & Most, 1981;Fenson & Ramsey, 1980), and motivational views suggest quantitative measures of the amount of play (e.g., Dember & Earl, 1957; Hutt, 1976; Rubenstein, 1974), but a systems theory view suggests organizational measures of play behaviors. The organization of attention during play may offer a rich source of information in subsequent research about how age changes in play may proceed.

The view of play that has guided this research concerns developmental change in the individual's goals of play. It takes advantage of the two major views of play by considering both development and motivation, both emerging abilities and individual goals. What this view adds is an explanation of play as a system of behavior organized in relation to play materials, persons, and situations. This study predicted age differences in play behavior like developmental studies of play and used dimensions of the situation and materials to predict goal-directed behavior like motivational studies of play. In addition, however, this study tested predictions of specific ways that individuals might change their existing play behavior to meet new goals in relation to emerging skills during the course of development. The results provide support for a model of play as a strategy for creating moderately challenging experience as part of the individual's active role in development.

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Table 1
Duration of Looking to Trains and Mother in Three Age Groups

	10-month-olds		15-month-olds		29-month-olds	
	M	sd	M	sd	M	sd
Social Train	172.3	71.5	194.1	72.5	218.6	51.4
Nonsocial Train	150.1	68.7	149.5	47.9	191.9	58.4
Mother	120.2	71.3	109.0	66.9	74.9	42.2
Proportion to social train	.53	.17	.56	.13	.54	.12

Table 2
Proportion of Looking Time to Mother Between Looks to Trains in Three Age Groups

	10-month-olds		15-month-olds		29-month-olds	
	M	sd	M	sd	M	sd
S - M - S	.13	.11	.22	.16	.23	.15
N - M - N	.12	.11	.11	.09	.17	.12
S-M-N	.12	.11	.08	.07	.12	.08
N-M-S	.09	.07	.10	.07	.12	.08

S = look to social train
M = look to mother
N = look to nonsocial train.